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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/507,321	06/28/2005	Yoshimaro Fujii	46884-5317 (210777)	2802

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EXAMINER	
ULLAH, ELIAS	

ART UNIT	PAPER NUMBER
2892	

NOTIFICATION DATE	DELIVERY MODE
10/20/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

DBRIPDocket@dbr.com
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Office Action Summary	Application No.	Applicant(s)	
	10/507,321	FUJII ET AL.	
	Examiner	Art Unit	
	ELIAS ULLAH	2892	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 June 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *56-111* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *56-111* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 June 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :2/26/2010, 9/15/2010, 8/31/2010, 8/25/2010, 8/16/2010, 8/12/2010, 8/2/2010, 7/20/2010, 6/25/2010, 6/2/2010, 4/27/2010, 3/25/2010, 3/9/2010 and 10/7/2010.

DETAILED ACTION

1. This office action is in response to an amendment filed on June 30th, 2010.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 56, 57, 59, 61, 63, 69, 70-73, 75, 77, 79, 85-88, 90, 91, 93, 97-100, 102, 103, 105, and 109-111 are rejected under 35 U.S.C. 102(b) as being anticipated by Sasaki et al (Sasaki, US 6,294,439 of IDS record).

With regard to claims 56, 72, 88 and 100, Sasaki shows substrate dividing method comprising the steps of: irradiating a laser light incident face of a substrate with laser light while positioning a light-converging point within the substrate (23 in Fig. 8 with respect to Fig. 9 and col. 9, lines 5+, wherein grooves 22 can created by a laser scriber i.e. irradiating), so as to form a modified region (result of laser scribing) only within the substrate (23 in Fig. 9), the substrate having a front face (front face of substrate 23) and a rear face through the substrate (rear face of substrate 23 see Fig. 23), the front face of the substrate being formed with a functional device (col. 8, lines 24+), and the modified region forming a starting point region for cutting the substrate inside the substrate at a predetermined distance from the laser light incident face of the substrate (see Fig. 9); grinding the rear face of the substrate (Fig. 9 and abstract) after (

grinding is done after laser scribing i.e. modified region as result of laser scribing) the step of forming the starting point region such that, after the grinding, the substrate comprises at least a portion of the modified region (see Fig. 9); and dividing the substrate(col. 9, lines 33+), wherein the substrate is divided when a fracture generated in a thickness direction of the substrate from the starting point region for cutting reaches the laser light incident face and the rear face of the substrate (as shown in Fig. 16 with respect to Fig. 9) in order to provide at least one manufacture devise (29 in Fig. 14).

With regard to claims 57 and 73, Sasaki shows substrate dividing method comprising the steps of: wherein the substrate (23) is a semiconductor substrate (col. 1, line 26+).

With regard to claims 59, 75, 90 and 102, Sasaki shows substrate dividing method comprising the steps of: wherein the modified region is a molten processed region (results of laser scribing as discussed above claim 56).

With regard to claims 61, 77, 91 and 103, Sasaki shows substrate dividing method comprising the steps of: wherein the laser light incident face of the substrate is formed with a functional device (col. 8, line 24+).

With regard to claims 63, 79, 93 and 105, Sasaki shows substrate dividing method comprising the steps of: wherein the modified region includes a crack region (result of laser scribing as discussed above claim 56).

With regard to claims 69, 85, 97 and 109, Sasaki shows substrate dividing method comprising the steps of: wherein the substrate is divided into a plurality of chips

along lines along which the substrate is divided and the lines being arranged in a lattice for the substrate (see Fig. 16A-16B with respect to Fig. 9).

With regard to claims 70, 86, 98 and 110, Sasaki shows substrate dividing method comprising the steps of: wherein the substrate is divided when the fracture (result of laser scribing) reaches the front face and the rear face of the substrate after the step of grinding the substrate (see Fig. 9).

With regard to claims 71, 87, 99 and 111, Sasaki shows substrate dividing method comprising the steps of: wherein the substrate is divided when the fracture reaches the front face and the rear face of the substrate in the step of grinding (see Fig. 9 with respect to Fig. 14).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 60 and 76 are e rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki et al (Sasaki, US 6,294,439 of IDS record).

With regard to claims 60, 76, Sasaki does not expressly teach the substrate is an insulating substrate. However, it is typical in the substrate can be an insulating substrate see Hoekstra (of record) in col. 4, liens 30-32 wherein sapphire is insulated substrate, see instant application publication number US 2005/0272223 at [0012].

7. Claims 58, 64-66, 74, 80-82, 89, 94-96, 101 and 106-108 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki et al (Sasaki, US 6,294,439 of IDS record) in view of Piwczyk et al. (US 6,376,797 of record).

With regard to claims 58, 64-66, 74, 80-82, 89, 94-96,101 and 106-108 Sasaki teaches a substrate dividing method with laser scribing (see above claim 56 discussions), but fails to teach wherein the substrate is irradiate with a pulse width of 1us or less and the substrate is irradiated with the laser light under a condition with a peak power density of at least 1×10^8 (W/cm2).

Piwczyk teaches Nd: YAG laser with wherein the substrate is irradiate with a pulse width of 1us or less and a peak power density of 0.9×10^9 W/cm^2 for 10ns for creating micro crack (col. 4, lines 20-40). At the time the invention was made, it would have been obvious to a person having ordinary skill in the art to use a Nd: YAG laser with a peak power density of 0.9×10^9 W/cm^2 for creating micro crack teaching of Piwczyk in the laser processing method of Sasaki, because Hoekstra Nd: YAG laser

(col. 6, lines 24-30) can be used for a peak power density of 0.9×10^9 W/cm^2 for creating micro crack for cutting a substrate. Further, differences in processing parameters e.g. pulse width range will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ratio or temperature is critical. Where there general conditions of a claim are disclosed in the prior art, it is not inventive to discover the opium or workable ranges by routine experimentation see MPEP 2144.05.

The recitation of "the modified region includes a refractive index change region which is a region with a changed refractive index" is only a statement of the inherent properties of the instant process of Nd: YAG laser pulse e.g. Nd: YAG laser on a glass substrate (col. 1, lines 25-230) and peak power density of Piwczyk. The process recited in "laser processing e.g. ND: YAG" is substantially identical (see instant application US 2005/0272223 in [0106]) to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.02.

8. Claims 62, 78, 92 and 104 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki et al. (Sasaki, US 6,294,439 of IDS record) in view of Glenn et al. (Glenn, US 2004/0245659).

With regard to claims 62, 78, 92 and 104, Sasaki teaches removing the rear face of the substrate by lapping and polishing, but fails to teach chemical etching.

However, Glenn teaching substrate can be thinned by polishing or etching techniques (e.g. ¶ [0044]). At the time the invention was made, it would have been obvious to a person having ordinary skill in the art to thin a substrate either polishing or etching, because such techniques are conventional method for thinning substrate as taught by Glenn in [0044].

9. Claims 67, 83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki et al. (Sasaki, US 6,294,439 of IDS record) in view of Hatangadi et al. (Hatangadi, US 6,726,631 of record).

With regard to claims 67 and 83, Sasaki teaches a substrate dividing method wherein the substrate (see above claim 56 discussions) but fails to teach the substrate is made of piezoelectric material.

However, Hatangadi teaches the substrate 130 (Fig. 3) is made of piezoelectric material (col. 10, lines 10-25). At the time the invention was made, it would have been obvious to a person having ordinary skill in the art to replace Sasaki's substrate 23 with a piezoelectric substrate of Hatangadi in the substrate dividing method of Hoekstra, because a piezoelectric substrate is able create variable cut size in the laser cutting as taught by Hatangadi in (col. 10, lines 10-30).

10. Claims 68 and 84 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki et al. (Sasaki, US 6,294,439 of IDS record) in view of Hatangadi et al. (Hatangadi, US 6,726,631) and further in view of Piwczyk et al. (US 6,376,797)

With regard to claims 68 and 84, Sasaki teaches a substrate dividing method with laser scribing (see above claim 56 discussions), but fails to teach wherein the substrate is irradiate with a pulse width of 1us or less and the substrate is irradiated with the laser light under a condition with a peak power density of at least 1 x 10^8 (W/cm2).

Piwczyk teaches Nd: YAG laser with wherein the substrate is irradiate with a pulse width of 1us or less and a peak power density of 0.9 x 10^9 W/cm^2 for 10ns for creating micro crack (col. 4, lines 20-40). At the time the invention was made, it would have been obvious to a person having ordinary skill in the art to use a Nd: YAG laser with a peak power density of 0.9 x 10^9 W/cm^2 for creating micro crack teaching of Piwczyk in the laser processing method of Sasaki, because Hoekstra Nd: YAG laser (col. 6, lines 24-30) can be used for a peak power density of 0.9 x 10^9 W/cm^2 for creating micro crack for cutting a substrate.

Response to Arguments

11. Applicant's arguments with respect to claims 56-111 have been considered but are moot in view of the new ground(s) of rejection.

12. Applicant's arguments see pages 15-16, filed on 6/30/2010, with respect to claims 56-111 have been fully considered and are persuasive. The nonstatutory obviousness-type double patenting rejection has been withdrawn.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ELIAS ULLAH whose telephone number is (571)272-1415. The examiner can normally be reached on weekdays, between 8AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thao Le can be reached on (571) 272-1708. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Elias Ullah/
Examiner, Art Unit 2892

/Trung Dang/
Primary Examiner, Art Unit 2892